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| EXAMINER | |
|---|---|
| JUNTIMA, NITTAYA | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2663 | 9 |

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/479,433 | KHAUNTE ET AL. | |
| | Examiner | Art Unit | |
| | Nittaya Juntima | 2663 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. As indicated in the previous Office action, Fig. 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 16 recites the limitation "said different propagation delay value" in line 3. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-7, 9-24, 26-37,** and **39-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over *"Data-Over-Cable Service Interface Specifications"* by Cable Television Laboratories, Inc. (DOCSIS) in view of Nose (USPN 6,643,295 B1).

Per **claim 1**, DOCSIS teaches ***an access network*** (cable network in Fig. 3-3, pg. 13), ***a Head End*** (Headend in Fig. 1-2, pg. 3), ***a plurality of nodes*** (Cable Modems, CMs #1-2 in Fig. 3-3, pg. 13), ***an access control system*** (CMTS in Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***a current time reference source*** (a current time reference source is inherently included in the Head End to provide time reference, section 7.1, 1st paragraph, pg. 103), ***at least one downstream channel*** (a downstream channel on fiber connecting between Head End transmitter and O/E node is used by the Head End to communicate with cable modems, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***at least one shared-access upstream channel*** (a shared-access upstream channel on fiber is connecting between Head End transmitter and O/E node and in communication with cable modems, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), ***a MAP generating device*** (as MAP PDUs must be transmitted by CMTS to the cable modems to define transmission opportunities on the upstream channel, therefore, it is inherent that a MAP generating device must be included in the CMTS to generate MAP for transmission, lines 1-2 and section 7.1.1, pg. 104), ***future allocation start time (SAT)*** (Alloc Start Time/an effective starting time $t_3$, section 6.3.4, pg. 75 and section 7.7.6, pg. 108), ***a LAT value*** (a worst-case roundtrip propagation delay; $t_3 - t_1$, where $t_1$ is a current time value and $t_3$ is an effective starting time, sections 7.1.5 and 7.1.6, pgs. 107-108), ***obtaining propagation delay data*** (propagation delay data reads on the roundtrip propagation delay, initial and periodic ranging processes performed between CMTS and a cable modem (a node or a portion of the plurality of nodes) are used to acquire the timing offset which inherently includes the roundtrip propagation delay and the processing delay as well known in the art, section 6.3.5, 1st paragraph, lines 1-2, pg. 78, and section 7.3.3, pgs. 110-111).

DOCSIS does not teach dynamically adjusting the LAT value using the propagation delay data.

However, as shown in Figs. 10 and 14, Nose teaches adjusting the current maximum transmission delay (caused by the most theoretically distant cable modem) associated with the transmission of MAP message for the at least one upstream channel using propagation delay obtained from ranging procedures (col. 4, lines 64-col. 7, lines 1-13).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to dynamically adjust the LAT of DOCSIS with the current transmission delay of Nose in order to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, lines 7-14 51-67).

Per **claims 2-4**, **18-19**, **35**, **44-46**, and **49**, DOCSIS teaches that LAT includes ***a MAP construction delay at the Head End*** (queuing delays within the CMST), ***an interleaver delay*** (PMD-layer FEC interleaving), the worst roundtrip delay, and ***a MAP processing delay at a network node*** (CM MAP processing time) (section 7.1.5, pg. 107).

DOCSIS fails to teach a min. propagation delay value, a maximum runtime propagation delay value, and calculating LAT using the min. propagation delay value.

However, Nose teaches ***a min. propagation delay value*** (the current max. transmission delay, Fig. 10, col. 6, lines 18-45) and ***a maximum runtime propagation delay value*** (the current max. transmission delay, Fig. 10, col. 6, lines 18-45). In addition, Nose teaches calculating the

current transmission delay, which is based on the propagation delay of the most theoretically distant terminal, to optimize the network efficiency (Fig. 10 and col. 6, lines 52-64).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to include the min. and max. propagation delay values into the teaching of DOCSIS and use the min. propagation delay of Nose (the current max. transmission delay) to calculate the LAT of DOCSIS to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, lines 7-14 51-67).

Per **claims 5-6**, **22-23**, **36**, and **47**, DOCSIS fails to teach the limitations as recited in the claims. However, as shown in Fig. 10, Nose teaches ***determining a first propagation delay/propagation delay value for a first node/each node that initiates a ranging procedure*** (steps 12 and 13), ***comparing the first propagation delay value to a stored propagation delay value/comparing each of the delay values to determine a largest propagation delay value*** (step 14), ***and assigning the largest propagation delay value as the minimum propagation delay value for the upstream channel*** (the current transmission delay is assigned in steps 14 and 15) (col. 5, lines 4-col. 6, lines 44).

Per **claims 7, 24,** and **37**, DOCSIS teaches that the access network is ***a cable network*** (cable network in Fig. 3-3, pg. 13), ***the plurality of nodes are cable modems*** (Cable Modems, CM #1-2 in Fig. 3-3, pg. 13), ***the access control system is a Cable Modem Termination System*** (CMTS in Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), and ***the propagation delay data corresponds to***

***offset data*** (the roundtrip propagation delay inherently included in the timing offset as known in the art, lines 1-3, pg. 110, and section 7.3.3, pgs. 110-111).

Per **claims 9-10** and **26-27**, DOCSIS teaches that ***ranging procedure is an initial ranging procedure*** and ***a periodic ranging procedure performed between the node*** (cable modem) and ***the access control system*** (CMST) (section 6.3.5, 1st paragraph, lines 1-2, pg. 78 and section 7.3.3, pgs. 110-111).

Per **claims 11-14**, **28-31**, and **39-40**, DOCSIS teaches that the propagation delay data associated with each on-line modem on the upstream channel must be inherently stored in a data structure at the Head End for additional fine tuning and association with SID (section 7.3.3, pgs. 110-111), but does not teach re-calculation and an occurrence of an event as recited in claim 12.

However, Nose teaches ***re-calculating the min. propagation delay value*** (the current max transmission time) ***using the stored propagation delay values, wherein the re-calculation is triggered by an occurrence of an event: a farthest on-line node switching to a different upstream channel or going off-line*** (operation state of the theoretically distant terminal, e.g. addition or removal of the terminal, affects and leads to recalculation of the current transmission delay, Fig. 10, col. 6, lines 52-col. 7, lines 1-13, see also col. 1, lines 7-14 and 63-67).

Per **claims 15-16**, **32-33**, and **41-42**, DOCSIS teaches ***a LAT*** (a worst-case roundtrip propagation delay; $t_3 - t_1$) ***and MAP messages which do not include initial ranging slot allocations*** (the allocation MAP messages) (sections 7.1.5 and 7.7.6, pgs. 107-108), but fails to teach a min LAT and a second LAT as recited in the claims.

However, Nose teaches ***determining a min propagation delay value*** (the current transmission delay) ***corresponding to a farthest on-line node on the upstream channel*** (Fig. 10,

col. 6, lines 52-64). Nose further teaches (i) calculating the current transmission delay, e.g. L2, using a max. propagation delay value which is based upon a max. allowed distance between a node and the Head End in a case where a new node, e.g. node F, is located farthest from the Head End just joins, and (ii) inherently using this current transmission delay, L2, for MAP M3 transmission, which includes at least one initial ranging slot, during periodical ranging procedures (Fig. 10, col. 5, lines 11-20, col. 6, lines 35-45, and Fig. 14, col 6, lines 52-col. 7, lines 1-13).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to use a min. LAT calculated by using the min. propagation delay value (the current transmission delay) to generate MAP messages and use a second LAT calculated by using a max. propagation delay value (the current transmission delay of the farthest cable modem, e.g. node F) to generate MAP messages which include at least an initial ranging slot to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, lines 7-14 51-67).

**Claim 17** is a Head End claim corresponding to method claim 1, and is rejected for the same reason set forth in claim 1.

Per **claims 20-21**, DOCSIS fails to teach memory for storing a min. propagation delay value and an optimized LAT value. Nose teaches ***memory*** (16 in Fig. 9) ***for storing a min. propagation delay value*** (the current transmission delay) ***corresponding to a farthest on-line node on the upstream channel*** (Fig. 10, col. 6, lines 14-35).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to set the LAT of DOCSIS to the min. propagation delay (the current transmission delay) of Nose and store it as an optimized LAT derived from the min. propagation delay value (the current transmission delay) to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, lines 7-14 51-67).

**Claim 34** is a computer program product claim corresponding to method claim 1, and is rejected for the same reason set forth in claim 1 with the addition that the combined teaching of DOCSIS and Nose does not teach a computer usable medium having computer readable code which comprises computer code. However, it would have been obvious to one skilled in the art to include computer code, computer readable code, and a computer usable medium into the claimed computer program product for automatic execution, simple implementation, and portability purposes.

**Claim 43** is a method for generating messages claim corresponding to method claim 1, and is rejected for the same reason set forth in claim 1.

**Claim 48** is an apparatus for generating messages claim corresponding to method method claim 1, and is rejected for the same reason set forth in claim 1.

5. **Claims 8, 25,** and **38**, are rejected under 35 U.S.C. 103(a) as being unpatentable over *"Data-Over-Cable Service Interface Specifications"* by Cable Television Laboratories, Inc.

(DOCSIS) in view of Nose (USPN 6,643,295 B1), and further in view of Raissinia et al. (UPSN 6,430,193 B1).

The combined teaching of DOCSIS and Nose does not teach that the access network is a wireless network.

However, as shown in Fig. 1, Raissinia et al. teaches that the access network is a wireless network (a point-to-multipoint wireless communication network 100, col. 2, lines 4-28 and col. 3, lines 64-67-col. 4, lines 1-23 and 40-54).

Given the teaching of Raissinia et al., it would have been obvious to one skilled in the art to include a wireless network such as a point-to-multipoint wireless communication network into the access network, i.e. the cable network, of the combined teaching of DOCSIS and Nose as they both involve the same concept of accessing a shared medium in order to take advantage of low cost hardware and software which are readily available (Raissinia et al., col. 2, lines 29-35).

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 703-306-4821. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 703-308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nittaya Juntima
February 20, 2004
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